DOCUMENT RESUME

ED 141 699 CG 011 525

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TITLE Lateral Eye Movement and Cogitation in Junior High School Students.
PUB DATE [74]
NOTE 9p.; Paper presented at the Annual Meeting of the Western Psychological Association (Los Angeles, California, April 8-11, 1976)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Cerebral Dominance; *Eye Movements; Eye Voice Span; Junior High Schools; Junior High School Students; Neurological Organization; *Perceptual Motor Coordination; *Reactive Behavior; Research Projects; *Response Mode; Sex Differences; *Visual Perception

ABSTRACT

In a between-subject experimental design, 31 randomly selected junior high school students demonstrated lateral eye movement (LEM) immediately following the administration of each question in a group of questions, designed to alternately activate either the left or the right cerebral hemisphere. Because the subjects showed consistency in their lateral eye movement during a questioning period, it can be concluded that the type of question posed did not have any significant influence on the direction of this movement. Furthermore, 70% of the female subjects displayed lateral eye movement in a particular direction, thus providing data which contradicted previous research findings which have indicated that adult female subjects are inconsistent in their lateral eye movement when asked a reflective question. (Author)

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ED141699

Lateral Eye Movement and Cogitation in Junior High School Students

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Abstract

In a between subject experimental design, 31 randomly selected junior high school students demonstrated lateral eye movement (LEM) immediately following the administration of each question in a group of questions, designed to alternately activate either the left or the right cerebral hemisphere. Because the subjects showed consistency in their lateral eye movement during a questioning period, it can be concluded that the type of question posed did not have any significant influence on the direction of this movement. Furthermore, 70 percent of the female subjects displayed lateral eye movement in a particular direction, thus providing data which contradicted previous research findings which have indicated that adult female subjects are inconsistent in their lateral eye movement when asked a reflective question.

Lateral Eye Movement and Cogitation in Junior High School Students

Lateral Eye Movement (LEM), which is the shifting of the eyes in a particular direction, was first documented by Merle Day in 1964 and has since been the topic of research for various other studies (Bakan, 1969, 1971; Day 1964, 1967; Duke, 1968; Kocel, Galin, Ornstein & Merrin, 1972; Weiten & Etaugh, 1974). In each of these studies it has been observed that people, immediately after being asked a question, shift their gaze from the questioner's eyes to either the left or right. Day has concluded from his research that this movement is consistent within individuals and bears little relationship to the type of question administered. Some researchers, however, have made a distinction between questions which are factual and those which are reflective (Duke, 1967). The direction taken by other researchers tends to further classify the questions as ones which either activate the left or right cerebral hemisphere while processing the content of the question (Kocel et al, 1972). While one study in LEM has drawn a correlation between eye movement and types of anxiety (Day, 1967), it has been suggested by Bakan (1969, 1971; Bakan & Svorad, 1969) that lateral eye movement is related to the functional specialization of the cerebral hemispheres. This hypothesis suggests that the direction of the lateral eye movement is an indicator of the activation of the contralateral hemisphere in processing the question.

It appears that there is a division between the "schools" which have studied lateral eye movement. There are those (Weiten & Etaugh, 1974; Day, 1964, 1967) who discribe lateral eye movement as a phenomenon which is consistent within individuals and is an indicator of specific types of personalities.

On the other hand, another direction has been taken which states that lateral eye movement is an indicator of contralateral cerebral activation (Bakan, 1969; Kocel et al, 1972). It should not be inferred, however, that there is a polarization between each school--indeed, many of the researchers have come up with data which support the "other school." It is because of this diversity in thought that the present study was designed in an attempt to either lend credence to one argument or the other. This project was designed to investigate the relationship between hemispheric activation and the direction of the resulting lateral eye movement.

Method

It was first necessary to determine which questions elicite a particular hemispheric activation (and thus might evoke a contralateral eye movement). This task was accomplished by reviewing previous studies (Kocel et al, 1972; Sperry, 1968) which had been directed towards hemispheric activity and its relation to either gross motor functions or verbal responses to a series of questions. The results of this literature search yielded a series of 14 questions which, in order to be correctly answered, required activation of a hemisphere previously (Kocel et al, 1972; Sperry, 1968) shown to be dominant for this type of task. A sample of a question which should activate the left hemisphere is "Solve the following mathematical problem: 4 x 6 + 12," whereas a question designed for the right hemisphere was, "It is summer and you are walking north and look down and notice that your shadow is on your right side; What time of day is it?" The questions were presented in an alternate order (left-right-left-right, etc.).

Subjects for this study were randomly chosen from the eighth grade class at Vina Danks Junior High School in Ontario, California. The random selection

yielded an experimental group of 31 students: 17 females and 14 males, with an average age of 13.19 years. The tests were individually administered in a regular classroom with the student directly facing the interviewer. Each student was told that the results would not be used in placement or have any effect on his or her status at school. Directly behind the interviewer was a video tape camera which had been activated prior to the interview session. The subject was unaware of the taping of the responses to the questions. While the interviewer scored the eye movement during the actual interview session, a video tape camera was positioned to record a facial picture which clearly showed the direction of eye movement. After the session, three observers independently scored the eye movements for each subject. If the scores of two of the three independent observers matched the interviewer's scoring, then the eye movement was recorded for further analysis. If there was no noticeable eye movement in any direction (e.g. the subject continued to look at the interviewer or shielded his/her eyes from view) then the question was not scored for that person. The time of day was contingent upon the availability of the classroom, but the sessions were generally conducted in the early morning. The sessions lasted for a period of about 10 minutes, with there being no emphasis on quickly administering the test.

Results

After the administration of the first five tests, one question was eliminated. This question required the student to gaze at a series of numbered figures and, after a ten second interval, recall what the number was of a particular figure. Because the subject was often gazing directly at that figure, eye movement was extremely difficult to ascertain, and, rather than attempting to determine the precise moment lateral eye movement

began, the question was eliminated. Often subjects would momentarily look in one direction and then in the other direction. These movements were scored as eye movements in the direction of the initial glance. The significance level was set at .05 and each question, along with the total number of left or right movements for all of the students' responses, was evaluated with a Chi Square Test. The students' results were individually analyzed to determine if they were significant movers in any one direction.

After computations, each question showed a Chi Square value of less than 1.25 which is far below the Chi Square value needed to satisfy the .05 level of confidence. Consequently, there didn't seem to be any difference in the number of left or right movements which each question elicited from all of the subjects. The individual's Chi Square for the group of 13 questions was also evaluated which showed that 11 subjects were inconsistent movers (4 male and 7 female). The remaining 17 subjects were significant movers in a single direction. There was a total of 14 left movers (5 males and 9 females) and 6 right movers (3 males and 3 females). These figures represent 66% of the total number of subjects as significant movers at the .05 level of confidence.

Discussion

The results showed that there was no significant relationship between the type of question posed and the direction of lateral eye movement. There were, however, interesting results obtained from the female subjects who were consistent movers in a particular direction 70% of the time. Of these female subjects, 75% were left movers and 25% were right movers. This result was not predicted because other studies (Duke, 1967; Weiten & Etaugh, 1974) have shown that female subjects have a high level of inconsistent

movements. Because the female subjects in this study yielded data which were not any different from the males, one might be lead to question the conclusions of some of the other studies. Prior to making such a decision, however, one should consider the samples' characteristics in the other studies. Both the Duke and the Weiten studies had female subjects who were of college age, whereas the subjects in this study were approximately 13 years old. If the data from the previous studies and this study are valid, then it would be logical to conclude that between the age of 13 and 20 the lateral eye movement of females has a tendency to become inconsistent. At this point, only speculation as to why such a phenomenon might occur is possible. Further research is needed which would address itself to the lateral eye movement of females at various age levels and determine whether females became inconsistent movers at a particular age level.

References

Bakan, P. Hypnotizability, laterality of eye movements and functional brain assymmestry. Perceptual and Motor Skills, 1969, 28, 927-932.

Bakan, P. The eyes have it. Psychology Today, 1971, 4 (11), 64-67. 96.

Bakan, P., & Svorad, D. Resting EEG alpha and asymmetry of reflective lateral eye movements. Nature, 1969, 223, 975-976.

Day, M.E. An eye movement phenomemon relating to attention, thought and anxiety. Perceptual & Motor Skills, 1964, 19, 443-446.

Day, M.E. An eye movement indicator of individual differences in the physiological organization of attentional processes and anxiety. Journal of Psychology, 1967, 66, 51-62.

Day, M.E. An eye movement indicator of type and level of anxiety: Some clinical observations. Journal of Clinical Psychology, 1967, 23 (4) 438-441.

Duke, J.D. Lateral eye-movement behavior. Journal of General Psychology, 1968, 78, 189-195.

Gazzaniga, M.S. The bisected brain. New York: Appleton-Century-Crofts, 1970.

Kocel, K., Galin, D., Ornstein, R., & Merrin, E. Lateral eye movement and conitive mode. Psychonomic Science, 1972, 27, 223-224.

Sperry, R.W. Hemisphere Deconnection and Unity in Conscious Awareness. American Psychologist, 1968, 23, 723-733.

Weiten, W. & Etaugh, C. Lateral eye-movement consistency is related to academic aptitude. Perceptual and Motor Skills, 1974, 38, 1203-1206.

Weiten, W. & Etaugh, C. Lateral eye-movement as a function of cognitive mode, question sequence, and sex of subject. Perceptual and Motor Skills, 1974, 38, 439-444.